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VIRULENT TREPONEMA PALLIDUM RECOVERED FROM A STILLBORN INFANT AFTER TWENTY-SIX HOURS

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Stillborn, congenitally syphilitic infants are the chief sources of material for the demonstration of treponema pallidum in tissues, because it is generally known that their organs commonly contain great numbers of the organisms. That the treponema occasionally retains its virulence for some hours after the death of the host, is not generally recognized and is, we believe, a new observation. Recently, we recovered virulent, actively motile, treponema pallidum from a stillborn infant 26 hours after it had been delivered, and we are reporting it to call attention to the fact that the chance of accidental infection from careless handling of syphilitic tissues is not as remote as is generally supposed. In this instance, the serum from superficial skin blebs and from crushed lung tissues were examined by the dark-field method, and great numbers of actively motile treponema were found. Rabbits, which were then inoculated intratesticularly with the material, developed the typical lesions of experimental syphilis.

The case is reported rather fully, since the mother's history presented some interesting features; the necropsy findings were somewhat unusual; and the well preserved state of the fetus may help to explain the retained virulence of the treponemas which it harbored.

A woman, married, white, aged 19 years, seven months pregnant, applied for admission to the hospital June 23, 1920, complaining of "wasting," and was delivered a few hours later. Family history unimportant. She stated she had always been well until about a year before when she had begun to have severe headaches, chiefly on the right side. About three months after the appearance of the headaches, she developed a general rash which first appeared on the forearms. She denied having had any venereal diseases but said she had been given eight injections of "salvarsan," though she had not had any during the last three months. Menstruation began at the age of 13, and occurred regularly. She had one child living and had had one miscarriage at 4½ months. Her last menstrual period was given as Nov. 22, 1919 (211 days before delivery). Blood taken for the Wassermann test, on admission, gave complete fixation with cholesterinized antigen, Neymann's antigen, and acetone insoluble antigen, + + + + reaction.

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Placenta.—The placenta presented none of the classical gross or microscopic lesions generally attributed to syphilis, due possibly to the eight arsphenamin treatments.

Fetus.—Premature stillborn infant, apparently about the seventh month. The dead fetus, together with the placenta, was placed in the refrigerator over night and sent to the laboratory for necropsy on the following day. Necropsy begun 26 hours after death.

Anatomic Diagnosis. — Congenital syphilis—pneumonia alba, multiple abscesses of thymus, papillary and vesicular syphilides, epiphyseal osteochondritis.

The body was well developed, fairly well nourished, and free from the changes commonly seen in still-born infants which have been retained in the uterus for some time after death. There were many fine papules and a few well developed blebs on the hands and feet. These were quite as numerous in the palms of the hands and on soles of feet as on the extensor surfaces. A few of the blebs were broken and slightly ulcerated, but there was no real maceration. There were no deformities, anomalies or rugae about the mouth.

Most of the organs were normal in appearance. The liver and suprarenals were distinctly enlarged. The thymus gland contained numerous small yellow cheesy areas. The lungs were mottled, white and red in color, opalescent in appearance, resilient to touch, and resembled pancreatic tissue on section. The ends of the long bones showed uneven lines of ossification.

Silver impregnation preparations of all of the tissues by the Levaditi and by the acetone silver methods showed great numbers of treponemas in the lung tissues, both in the interstitial tissues and in the exudate which filled the alveoli and bronchioles. A few treponemas were found in the papules, and many more in small pustules which were situated in the corium underneath some of the superficial blebs. Moderate numbers were also found in the heart muscle, spleen, liver and suprarenals. Microscopically, the small cheesy masses in the thymus were pustules, not gummas, and repeated silver stains failed to show the presence of treponema in them.

The cerebrospinal fluid gave a + + + + Wassermann test.

Dark-field examinations of the serum from the blebs and from crushed lung tissue showed great numbers of typical treponemas. A loop of cerebrospinal fluid contained an occasional treponema, the motility of which was questionable.

Two rabbits received intratesticular inoculations with serum from the blebs and lungs; both developed indurated nodules, and one a diffuse orchitis in addition. The nodules were late in appearing, the earliest being noted about seven weeks after inoculation. Treponemas were recovered from both animals and others inoculated. Repeated transfers have been made from animal to animal, and after nine months the strain still remains pathogenic for rabbits.

DISCUSSION

Aside from the mere fact that stillborn congenitally syphilitic infants may harbor the active virus of syphilis, the evidence obtained in this case raises an interesting point, namely, the inconsistency between the presence after death of active virus in tissues and the absence of any data on infection attributable to such material. There is a belief prevalent among laboratory men that treponema pallidum loses its virulence almost as soon as the host is dead, and that syphilitic tissues may be handled with impunity. Apparently, there is much negative evidence to support this view. The organs of syphilitic fetuses simply teem with treponema pallidum, as demonstrated by the use of various silver methods. Probably thousands of necropsies have been made on them by pathologists who did not wear gloves, and yet the statement that "There is not an authentic case of laboratory infection of syphilis on record," is often quoted. In this case we have an infant in whom actively virulent treponemata pallida were proved to be present. Here the pathologist stood a good chance of becoming infected if he had not been protected. The use of gloves, a whole unbroken skin, and the natural immunity which some persons appear to possess, may serve to explain the escape of many, but when one stops to think of the great number of exposures laboratory workers have had with so. little evidence of infection, something additional seems to be necessary for a complete explanation.

We have been making a series of experiments which may throw some light on the problem, and while these are not entirely completed we have already elucidated the following points: 1. Treponemas obtained from excised chancers retain their virulence for about 24 hours, as shown by rabbit inoculation. 2. Inoculations with the same materials made after 36 hours have as yet been uniformly negative. 3. Treponemas kept in excised tissues retain their motility for several weeks, if protected from drying. 4. Pieces taken from excised tissues positive for treponema pallidum and treated by one of the silver methods show that the staining qualities are retained for weeks, though no preservative of any kind is used. Sometimes the treponemas appear to be even more numerous after several weeks than they were in the tissues examined at the time the material was excised. We have not as yet been able to prove to our own satisfaction whether or not saprophytic growth actually occurs in these tissues.

Applying the foregoing observations, we find that treponema pallidum usually loses its power to infect, after about 27 hours' existence in dead tissues, but that it does not lose its staining characteristics for a long time. As a rule, syphilitic fetuses are badly macerated, showing that they have been dead in utero for a considerable length of time, so that it is probable that the treponemas which they contain have lost their virulence, though they have retained their staining qualities.

However, the demonstration of infectious treponema pallidum in one fetus makes it advisable to be on the safe side by adopting thorough measures for protection in examining all syphilitic tissues.